

ABSTRACT OF THE DISCLOSURE

The invention relates to an optical element with variable optical properties, which ensures that the amount of light available is increased, and an optical device using the same. In a liquid crystal variable hologram element 3, polymer layers 18 and liquid crystal layers 19 are alternately arranged between transparent substrates 16 and 17, with liquid crystal particles 20 lining up in each liquid crystal layer 19. When voltages are applied on transparent electrodes 21 and 22, liquid crystal molecules 23 have their longitudinal directions oriented vertically with respect to the electrodes, so that the refractive index of the polymer layers 18 is substantially equal to that of the liquid crystal layers 19, resulting in no development of hologram.

When the voltages are held off, the refractive index of the polymer layers 18 is different from that of the liquid crystal layers 19. This repetition gives rise to an interference fringe action, by which a hologram can be developed. Thus, the variable hologram element 3 can function as a hologram reflecting mirror.

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